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(54)【発明の名称】 着座センサ

(57)【要約】

【目的】 取付位置に制約が少なく、且つ確実に着座状態を検出する。

【構成】 便座1に検出電極1を取り付け、この検出電極1と大地との間の静電容量変化から人体Xの着座状態を検出する。

(58)【請求項1】 人が座る着座部に取り付けられる検出電極と、上記着座部の人体が近接しない部分で取り付けられた検出電極と、同一環境下で静電容量変化から人体の着座状態を検出する検出回路とを備える。この検出回路は、上記の静電容量変化から人体が近接する部分に取り付けられた検出電極と、上記着座部の人体が近接しない部分で取り付けられた検出電極と、同一環境下で静電容量変化から人体の着座状態を検出する検出回路とを備える。

【請求項2】 人が座る着座部の人体が近接する部分に取り付けられた検出電極と、上記着座部の人体が近接しない部分で取り付けられた検出電極と、同一環境下で静電容量変化から人体の着座状態を検出することを特徴とする着座センサ。

【請求項3】 人が座る着座部の人体が近接する部分に取り付けられた検出電極と、上記着座部の人体が近接しない部分で取り付けられた検出電極と、同一環境下で静電容量変化から人体の着座状態を検出することを特徴とする着座センサ。

【発明の詳細な説明】

【産業上の利用分野】 本発明は、人が座ったことを検出する着座センサに関するものである。

【既存の技術】 人が座ったことを検出する従来の着座センサとしては、連続ゴムを用いて着座面により導電ゴムを導通させて着座状態を検出する筋型のもの、あるいは光電センサを用いて光電子などからの光が人体で遮断されたことから着座状態を検出する光電式のものなどがある。この種の着座センサは、例えば、温水洗浄便座における使用状態の検出用、もしくはホールや転換などの着座検出用、さらにはマージ信号などに使用されてい

る。

【発明が解決しようとする課題】 ところが、上記筋型式の着座センサでは、確実に着座状態を検出することができるようにするために、取付位置が制約され、この導電ゴムの取付位置によっては使い心地が悪くなるという問題がある。しかも、その割りに確実に着座状態を検出することができず、個別性に欠けるという問題があつた。

【発明の効果】 また、光電式の着座センサの場合にも、取付位置に制約を受け、また外乱光等による誤動作が起こるという問題があつた。本発明は上述の点に鑑みてあされたものであり、その目的とするところは、取付位置の制約が少なく、使い心地に影響を与せず、且つ確実に着座状態を検出できる着座センサを提供することにある。

【課題を解決するための手段】 本発明では、上記目的を達成するために、人が座る着座部に取り付けられる検出電極と、この検出電極から検出回路2が人体Xの着座状態を検出する。

【発明の詳細な説明】 本発明では、上記目的を

達成するために、人が座る着座部に取り付けられる検出電極と、この検出電極から検出回路2が人体Xの着座状態を検出する。

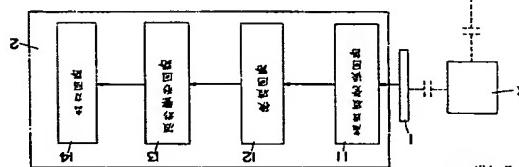


図3

【実施例1】 図1乃至図4に本発明の一実施例を示す。本実施例では、本発明の着座センサを図4に示す温水洗浄便座Aに適用した場合を例として説明する。この温水洗浄便座Aに適用した場合を例として説明する。この温水洗浄便座Aは、洋式の温水洗浄便座の便座の代わりに取り付けられ、温水を用いて用便後のぬのの洗浄を行ったり、光電式のように外乱による誤動作を行うこともないこににより、確実な着座状態の検出が可能となる。

【実施例2】 図5乃至図8に本発明の一実施例を示す。本実施例では、本発明の着座センサを図8に示す温水洗浄便座Aに適用した場合を例として説明する。この温水洗浄便座Aは、洋式の温水洗浄便座の便座の代わりに取り付けられ、温水を用いて用便後のぬのの洗浄を行ったり、光電式のように外乱による誤動作を行うこともないこににより、確実な着座状態の検出が可能となる。

【実施例3】 図9乃至図12に本発明の一実施例を示す。本実施例では、本発明の着座センサを図12に示す温水洗浄便座Aに適用した場合を例として説明する。この温水洗浄便座Aは、洋式の温水洗浄便座の便座の代わりに取り付けられ、温水を用いて用便後のぬのの洗浄を行ったり、光電式のように外乱による誤動作を行うこともないこににより、確実な着座状態の検出が可能となる。

【実施例4】 図13乃至図16に本発明の一実施例を示す。本実施例では、本発明の着座センサを図16に示す温水洗浄便座Aに適用した場合を例として説明する。この温水洗浄便座Aは、洋式の温水洗浄便座の便座の代わりに取り付けられ、温水を用いて用便後のぬのの洗浄を行ったり、光電式のように外乱による誤動作を行うこともないこににより、確実な着座状態の検出が可能となる。

【実施例5】 図17乃至図20に本発明の一実施例を示す。本実施例では、本発明の着座センサを図20に示す温水洗浄便座Aに適用した場合を例として説明する。この温水洗浄便座Aは、洋式の温水洗浄便座の便座の代わりに取り付けられ、温水を用いて用便後のぬのの洗浄を行ったり、光電式のように外乱による誤動作を行うこともないこににより、確実な着座状態の検出が可能となる。

が好ましい、この静電容量式のものを用いてある。この静電容量式の着座センサは、図2に示すように、更圧3.0の大脳部や脅骨3は、図6に示すように、検出電圧1の他に、比較電圧3を設け、夫々の電圧1、3と大地との間の静電容量の差分から着座状態を検知するのである。ここで、この静電容量センサの場合は、検出電圧1は人体Xの近接する部分に設け、比較電圧3は人体Xが近接しない部分に設ける。

【0016】この差動連延型の静電容量式着座センサの操作は、図2に示すように、検出電圧1は、パルス信号を発生する回路10と、このパルス信号を発生する回路1と大脳との間に人Xが介在することにより変化する。そこで、この静電容量の変化を検出することによつて、着座状態を検出するようにしてある。図1の着座センサの検出回路2は、上記記載回路1と大脳との間の静電容量に応じて駆動回路が変化する高周波駆動回路11を備え、この高周波駆動回路11の駆動周波数の変化を検出して着座検出を行っている。つまり、上記駆動回路11の出力が検出回路12で検波し、その後波駆動回路11の出力を検出回路12で検波し、その検波出力が波形整形回路13で波形整形して、その波形整形出力が駆動回路14に供給されると、駆動回路14が判別して回波検出化に応じた出力を温水洗浄便座Aのマイクロコンピュータなどとからなる制御部に与える。温水洗浄便座Aの制御部では着座状態の判断を行い、着座状態が検出されたときには、例えば操作部3の操作を可能とするといった制御である。

【0017】この着座センサでは、便器が使用されているときには、検出電圧4及び比較電圧5の夫々と大地との間の静電容量によつては位置感が生じないようにしてある。いま、便器が使用しないときに、便器がレザーチャーチの間に介在するために、操作部3の操作を可能とするといった操作である。

100-13 このように静電容量変化から人体Xの数据を検出する方法であると、検出電極1を人体Xと接触させながら舌を問わずにいかなる所にも取り付けることができる、このたまに位置の制約が少なくなる。しかも、導電ゴムを用いた充電方式のように圧力を加える構造を何等保てないので、使い心地に影響を与えない。さらには、充電式の場合のように取付状態により大きな静電気状態の発生度数が変動するにこぎつけない。また、静電気によるアラーム操作が、万一の誤動作を防ぐため、アラーム回路の起動条件を二つ以上とすることで、より安全である。

方のより前に進む。このようにして、上記の構成が得られる。

[0014] なお、検出電極1は大脳部や脅部が近接する部分以外に、例えば頭もいたる部、または体側の部分など、著しくて人Xが近接する部分に設けてもよい。また、人体Xと非接触で検出を行う場合には、検出電極1と検出物体Xとの間に绝缘物もしくは電気的に浮いた状態にある導電物が介在しても問題はない。さらに、検出電極1は人Xの近接部に広範囲にわたり検出できるようにすることが好ましい。このようにする場合には図3に示すように複数の検出電極1を人体Xが近接部に配置し、夫々の検出電極1をD線5で接続すれば構成される。

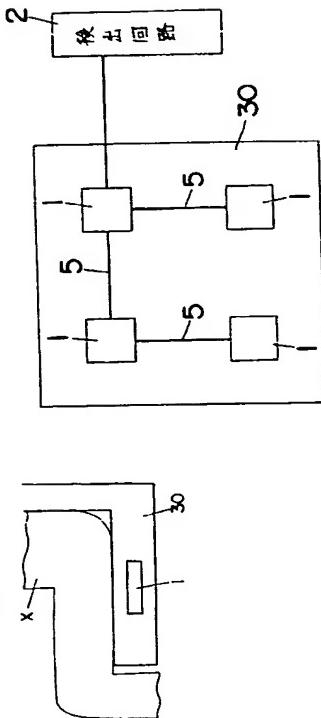
[0015] ここで、上記比較電極3は検出電極1と同じ環境となる部分に配置する。このようにすれば、この逆説型の静容量式座センサSでは、検出電極の逆説型の静容量式座センサSでは、検出電極1側と比較電極3側との夫々の容量結合の相対的な差を1側と比較電極3側との夫々の容量結合の相対的な差を求めるので、温度等による影響が相殺され、検出電極1側は検出方向以外の静電容量変化を起こさせない方向からの静電容量変化を起させない方向からの静電容量変化を起す可能性がある。そこで、これを防ぐための方法として、上記静電容量測定部やシザはらつきが少なくなる。さらに、上記静電容量測定部やシザはは検出方向以外の静電容量変化を起させない方向からの静電容量変化を起させない方向からの静電容量変化を起す可能性がある。そこで、これを防ぐための方法として、上記静電容量測定部やシザは

よい。なまこ、のりによじて、ひき出電は2.5W/m²である。
変える必要はない。

ところで、上述の静電容量式湿度センサの場合は、体感や更座30内に設けられるヒータ等の温度、あるいは湿度などによる断熱変化の影響で、その検出出力にばらつきを生じることがある。そこで、この点を補正がナス由田だけ、図5に示すが熱源部に対することとなむ。

The diagram shows three separate rectangular components. The top component is labeled '30' with a leader line. The middle component is labeled '15' with a leader line. The bottom component is labeled '5' with a leader line.

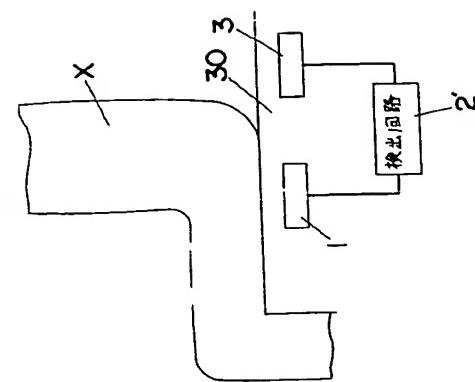
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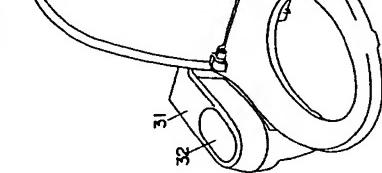
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[図6]

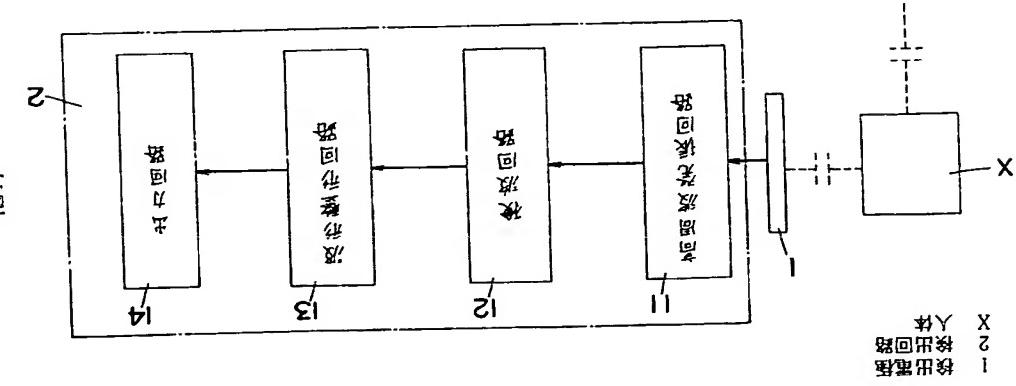


[図5]



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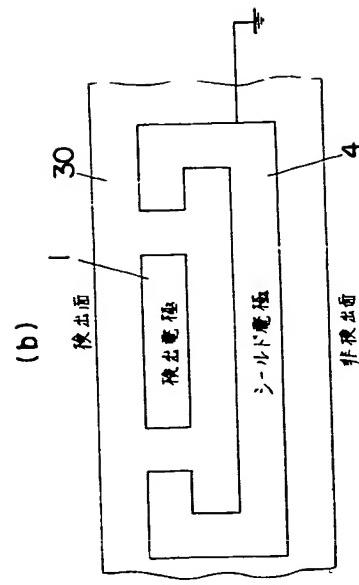
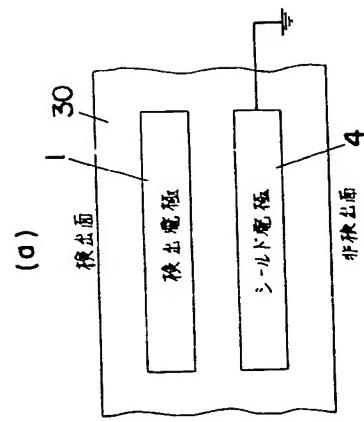
[図4]



(7)

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[図7]



PATENT ABSTRACTS OF JAPAN

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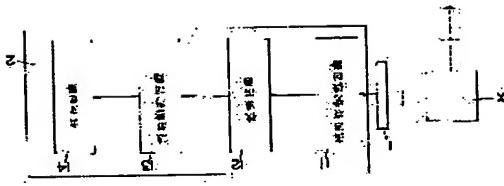
(22) Date of filing : 21.01.1992 (72) Inventor : YAJIMA TAKASHI INAGAKI NORORU

(54) SEATING SENSOR

(57) Abstract:

PURPOSE: To enable secure detection without limitation in an installed position by detecting a seating state of a human body from a capacitance change between a detection electrode of a seat and the ground.

CONSTITUTION: When a person sits on a lavatory seat, capacitance between a detection electrode 1 and the ground varies due to intervention of a human body X between the detection electrode 1 and the ground. With this capacitance change, an output of a high frequency oscillation circuit 11 is detected by a detector circuit 12, the detector output is shaped by a wave-shaping circuit 13, a frequency change in the wave-shaping output is discriminated by an output circuit 14, and an output corresponding to the frequency change is applied to a control part of a warm water cleaning lavatory seat. The control part determines a seating state, and when the seating state is detected, operation of an operation part is enabled.



LEGAL STATUS

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[Date of sending the examiner's decision of rejection]
 [Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

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[Date of requesting appeal against examiner's decision of rejection]

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CLAIMS

[Claim(s)]

[Claim 1] The taking-a-seat sensor characterized by having the detector which detects the taking-a-seat condition of the body, and consisting of the electrostatic-capacity change between the detection electrode attached in the taking-a-seat section on which people sit, and this detection electrode and earth.

[Claim 2] The taking-a-seat sensor characterized by to be the part which the detection electrode attached in the part which the body of the taking-a-seat section with which people sit down approaches, and the body of the above-mentioned taking-a-seat section do not approach, and to have the detector which detects the taking-a-seat condition of the body, and to consist of change of the difference of the electrostatic capacity between a detection electrode, the reference electrode attached in the bottom of the same environment, and each electrode and earth.

[Claim 3] The taking-a-seat sensor according to claim 1 or 2 characterized by having the screening electrode which intercepts electrostatic-capacity association of the direction of [other than the direction where the body approaches], and changing.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001] [Industrial Application] This invention relates to the taking-a-seat sensor which detects that people sat down.

[0002] [Description of the Prior Art] Since the light from a light emitting device etc. was intercepted in the body using load-type the thing or photoelectrical sensor which is made to flow through electrical conductive gum according to a taking-a-seat load, using electrical conductive gum as a conventional taking-a-seat sensor which detects that people sat down, and detects a taking-a-seat condition, there is a thing of the photoelectrical type which detects a taking-a-seat condition etc. This kind of taking-a-seat sensor is used for the MA&JI chair etc. by objects for taking-a-seat detection, such as objects for taking-a-seat detection, such as an object for detection of the busy condition in a toilet bowl warm water flush system, an automobile, a bus, an airplane, or a train, or a hole, and a theater, and the pan.

[0003] [Problem(s) to be Solved by the Invention] However, by the above-mentioned load-type taking-a-seat sensor, in order to enable it to detect a taking-a-seat condition certainly, an attaching position is restrained and there is a problem that a usage feeling worsens depending on the attaching position of this electrical conductive gum. And a taking-a-seat condition could not be detected comparatively certainly, but the problem that dependability was missing existed.

[0004] Moreover, also in the case of a photoelectrical-type taking-a-seat sensor, constraint was received in the attaching position and there was a problem that malfunction by disturbance light etc. took place. It is few, and a usage feeling is not affected and the place which succeeds in this invention in view of an above-mentioned point, and is made into the purpose has constraint of an attaching position in offering the taking-a-seat sensor which can detect a taking-a-seat condition certainly.

[0005] [Means for Solving the Problem] In this invention, in order to attain the above-mentioned purpose, it has the detector which detects the taking-a-seat condition of the body from the electrostatic-capacity change between the detection electrode attached in the taking-a-seat section on which people sit, and this detection electrode and earth. In addition, what is necessary is to be the part which the detection electrode attached in the part which the body of the taking-a-seat section with which people sit down approaches, and the body of the above-mentioned taking-a-seat section do not approach, and just to make the detector which detects the taking-a-seat condition of the body from change of the difference of the electrostatic capacity between a detection electrode, the reference electrode attached in the bottom of the same environment, and each electrode and earth have, in order to prevent that the detection sensitivity of a taking-a-seat condition changes according to an environmental variation. [0006] Moreover, in order to detect a taking-a-seat condition only in a required direction, it is desirable to prepare the screening electrode which intercepts electrostatic-capacity association of the direction of [other than the direction where the body approaches].

[0007]

[Function] This invention by detecting taking a seat of the body from electrostatic-capacity change as mentioned above if it is the part from which electrostatic capacity changes when people intervene between a detection electrode and the earth A detection electrode can be attached in any locations, without asking ** which is in the contact to the body and a detection electrode, and a non-contact condition. For this reason, by being able to lessen constraint of an attaching position and not having at all the structure of moreover applying a pressure to the body like the load method using electrical conductive gum it becomes detectable [a positive taking-a-seat condition] by not affecting a usage feeling not changing the detection sensitivity [in the case of a taking-a-seat condition sharply according to an attachment condition still like [in the case of a load type], or not performing malfunction by disturbance light like a photoelectrical type.]

[0008]

[Example] (Example 1) One example of this invention is shown in drawing 1 thru/or drawing 4 . This example explains as an example the case where it applies to the toilet bowl warm water flush system A which shows the taking-a-seat sensor of this invention to drawing 4 . This toilet bowl warm water flush system A is attached instead of the seat of the water closet of foreign style, and enables it to wash the part behind a stool using warm water. If actuation of this toilet bowl warm water flush system A operates the switch of the control unit 32 prepared in the top face of the armrest section 31 of one flank of the seat 30 etc., warm water will blow off from the washing nozzle which is not illustrated, and washing of a part will be performed. [0009] In this kind of toilet bowl warm water flush system A, it is not desirable that warm water etc. blows off from a washing nozzle in the condition that people have not sat down to the seat 30. Then, only when people have sat down to the seat 30, in order to enable it to operate a control unit 32, a taking-a-seat sensor is used. Moreover, in order for there to be also a thing equipped with the function which heats the seat 30 in winter as this kind of a toilet bowl warm water flush system A, to make the heating condition of a heater low in such a toilet bowl warm water flush system A at the time of un-using it, to lessen power consumption and to raise the heating condition of a heater at the time of use, the above-mentioned taking-a-seat sensor may be used.

[0010] Furthermore, after a stool, the above-mentioned taking-a-seat sensor is used for supply control of the sheet paper, and by what is equipped with deodorization equipment or the stream sound generator of the **** sake in a stool further again, also in order to drive these equipments automatically at the time of taking a seat etc., it is used at a thing equipped with the function which carries out automatic supply of the sheet paper put on the seat 30 (when people separate from the seat 30).

[0011] The thing of the electrostatic-capacity type shown in drawing 1 as a taking-a-seat sensor of this example is used. As shown in drawing 2 , this electrostatic-capacity-type taking-a-seat sensor attaches the detection electrode 1 in the part which the femoral region and hip of the seat 30 approach, and detects the taking-a-seat condition of Body X from the electrostatic-capacity change between this detection electrode 1 and earth. In addition, although the detection electrode 1 is laid underground in the seat 30 in drawing 2 , it is not necessary to necessarily lay underground.

[0012] Now, if people sit on the seat 30, as shown in drawing 1 , when Body X intervenes [the electrostatic capacity between the detection electrode 1 and the earth] between the detection electrode 1 and the earth, it will change. Then, the taking-a-seat condition is detected by detecting change of this electrostatic capacity. The detector 2 of the taking-a-seat sensor of drawing 1 is equipped with the RF oscillator circuit 11 where an oscillation frequency changes according to the electrostatic capacity between the above-mentioned detection electrode 1 and the earth, detects change of the oscillation frequency of this RF oscillator circuit 11, and is performing taking-a-seat detection. That is, the output of the above-mentioned RF oscillator circuit 11 is detected in a detector circuit 12, the detection output is shaped in waveform in a waveform shaping circuit 13, an output circuit 14 distinguishes frequency change of the waveform-shaping output, and the output according to frequency change is given to the control

section which consists of a microcomputer of a toilet bowl warm water flush system A etc. In the control section of a toilet bowl warm water flush system A, control of enabling actuation of a control unit 32 when a taking-a-seat condition is judged and a taking-a-seat condition is detected is performed.

[0013] Thus, it can attach in any locations, without asking whether Body X is contacted in the detection electrode 1 as it is the approach of detecting the taking-a-seat condition of Body X from electrostatic-capacity change, and, for this reason, constraint of an attaching position decreases. And since it does not have at all the structure of applying a pressure to the body like the load method using electrical conductive gum, a usage feeling is not affected. Furthermore, since the detection sensitivity of a taking-a-seat condition is not sharply changed according to an attachment condition like [in the case of a load type] and malfunction by disturbance light is not caused like a photoelectric sensing method, detection of a taking-a-seat condition can be ensured.

[0014] In addition, the detection electrode 1 may be formed in the part which Body X approaches by taking a seat of the part by the side of for example, the back board section or the body etc. in addition to the part which a femoral region and a hip approach. Moreover, in detecting by Body X and non-contact, it is satisfactory even if the electric conduction object in an insulating material or the condition of having floated electrically intervenes between the detection electrode 1 and the detection body X. Furthermore, as for the detection electrode 1, it is desirable to enable it to reach far and wide and detect in the contiguity section of Body X. What is necessary is to arrange two or more detection electrodes 1 in the contiguity section of Body X, as shown in drawing 3 in doing in this way, and for lead wire 5 just to tie each detection electrode 1. In addition, even if such, it is not necessary to change the configuration of a detector 2 at all.

[0015] By the way, in the case of an above-mentioned electrostatic-capacity type taking-a-seat sensor, dispersion may be produced at the detection output under the effect of the environmental variation by the temperature of a heater etc. established in temperature or the seat 30, or humidity. So, when improving this point, it is desirable to make it the differential delayed type shown in drawing 5. As shown in drawing 6, the electrostatic-capacity type taking-a-seat sensor of this differential delayed type forms the reference electrode 3 other than the detection electrode 1, and detects a taking-a-seat condition from the difference of the electrostatic capacity between each electrodes 1 and 3 and earth. Here, in the case of this electrostatic-capacity type taking-a-seat sensor, the detection electrode 1 is formed in the part which Body X approaches, and a reference electrode 3 is formed in the part which Body X does not approach.

[0016] Detector 2 of the electrostatic-capacity type taking-a-seat sensor of this differential delayed type the pulse generating circuit 21 which generates a pulse signal, the adjustable delay circuit 221 which generates the output delayed according to the electrostatic capacity between the detection electrode 1 and a reference electrode 3, and a ground, respectively, in the output of this pulse generating circuit 21, and 222 each adjustable delay circuit 221 and 222. The waveform shaping circuit 231 which shapes an output in waveform, and 232 The delay equalization circuit 241 which only the amount of arbitration delays each waveform-shaping output, and performs offset adjustment of an output, and 242 It constitutes from a phase sensitive discriminator 25 which discriminates from the phase contrast of the output of each delay control circuit 24.

[0017] When the toilet bowl is not used, it is made to have not produced phase contrast by this taking-a-seat sensor depending on the electrostatic capacity between each of the detection electrode 4 and a reference electrode 5, and the earth. If people sit on the seat 30 now for a stool, since Body X intervenes between the detection electrode 4 and the earth, the electrostatic capacity between the detection electrode 4 and the earth changes, on the other hand, also when Body X sits on the seat, the electrostatic capacity between a reference electrode 5 and the earth is boiled so much, and does not change. For this reason, the adjustable delay circuit 221 and 222 The amount of delay of an output changes a lot, phase contrast is detected in a phase sensitive discriminator 25, and it is distinguished from this output that

people sat down in the control circuit which consists of a microcomputer of a toilet bowl warm water flush system A etc. That is, by the electrostatic-capacity type taking-a-seat sensor S of this differential delayed type, taking-a-seat detection is performed from the relative difference of each capacity coupling by the side of the detection electrode 4 and a reference electrode 5. [0018] Here, the above-mentioned reference electrode 3 is arranged into the part used as the same environment as the detection electrode 1. By the electrostatic-capacity type taking-a-seat sensor S of this differential delayed type, if it does in this way, since the relative difference of each capacity coupling by the side of the detection electrode 1 and a reference electrode 3 is searched for, the effect by temperature etc. will be offset and dispersion in a detection output will decrease. Furthermore, by the above-mentioned electrostatic-capacity type taking-a-seat sensor, the electrostatic-capacity change from the direction where it is not wished other than the detection direction may be detected, and malfunction may be caused. Then, what is necessary is just to intercept electrostatic-capacity association in the direction which is not required, in order to make it not make electrostatic-capacity change of the direction except performing body X detection cause.

[0019] In that case, what is necessary is just to shield between the detection electrode 1 and the detection direction which is not required. For example, in order to consider as the structure where the toilet bowl or waterdrop of the seat 30 are not detected, the screening electrode 4 grounded under the detection electrode 1 as shown in drawing 7 (a) is arranged. If it does in this way, unnecessary electrostatic-capacity association of the lower part of the seat 30 is intercepted, and taking-a-seat detection can be performed only in a required direction. Furthermore, it is still more desirable, if it considers as the structure which shields all the directions except the upper part with a screening electrode 4 as shown in drawing 7 (b).

[0020] [Effect of the Invention] Since this invention is equipped with the detector which detects the taking-a-seat condition of the body from the electrostatic-capacity change between the detection electrode attached in the taking-a-seat section on which people sit as mentioned above, and this detection electrode and earth and taking a seat of the body is detected from electrostatic-capacity change If it is the part from which electrostatic capacity changes when people intervene between a detection electrode and the earth A detection electrode can be attached in any locations, without asking ** which is in the contact to the body and a detection electrode, and a non-contact condition. For this reason, since it does not have at all the structure of applying a pressure to the body like the load method there being little constraint of an attaching position and using electrical conductive gum moreover A usage feeling is not affected, but since the detection sensitivity of a taking-a-seat condition is not sharply changed according to an attachment condition still like [in the case of a load type] or malfunction by disturbance light is not performed like a photoelectrical type, it becomes detectable [a positive taking-a-seat condition].

[0021] Moreover, the detection electrode attached in the part which the body of the taking-a-seat section with which people sit down approaches, The reference electrode which is the part which the body of the above-mentioned taking-a-seat section does not approach, and is attached in the bottom of the same environment as a detection electrode. If it has the detector which detects the taking-a-seat condition of the body from change of the difference of the electrostatic capacity between each electrode and earth By taking the relative difference of the same elements, such as an environmental variation, can be offset and it can prevent that the detection sensitivity of a taking-a-seat condition changes according to an environmental variation.

[0022] Furthermore, if the screening electrode which intercepts electrostatic-capacity association of the direction of [other than the direction where the body approaches] is prepared, electrostatic-capacity association in the direction which is not required can be intercepted, and a taking-a-seat condition can be detected only in a required direction.

[Translation done.]

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1. This document has been translated by computer. So the translation may not reflect the original precisely.
2. *** shows the word which can not be translated.
3. In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the circuit diagram of the taking-a-seat sensor of one example of this invention.

[Drawing 2] It is the explanatory view of the arrangement approach of a detection electrode

same as the above.

[Drawing 3] It is wide range and is the explanatory view of the arrangement approach of the detection electrode in the case of enabling it to detect the body.

[Drawing 4] It is the perspective view showing the toilet bowl warm water flush system to which the same as the above is applied.

[Drawing 5] It is the circuit diagram of the taking-a-seat sensor of other examples.

[Drawing 6] It is the explanatory view of the arrangement approach of an electrode same as the above.

[Drawing 7] (a) and (b) are explanatory views of an approach which prevent electrostatic capacity association in an unnecessary direction.

[Description of Notations]

1 Detection Electrode

2' Detector

3 Reference Electrode

4 Screening Electrode

30 Seat

X Body

[Translation done.]